

AM-based JEM strategy

Brattin, Bill to: Hilbert, Timothy (hilbertj), benson.bob, Berry.David

06/15/2012 08:43 AM

From: "Brattin, Bill" <brattin@srcinc.com>

To:

Cc: "Borton, Eric (bortonek)" <BORTONEK@UCMAIL.UC.EDU>, "Rice, Carol (ricech)" <ricech@ucmail.uc.edu>, "Lemasters, Grace (lemastgj)" <LEMASTGJ@ucmail.uc.edu>, "Lockey, James (lockeyje)" <lockeyje@UCMAIL.UC.EDU>

Here is an Excel spreadsheet that offers one potential approach to fitting and extrapolating concentration values by year by area to generate the JEM based on un-transformed data.

This is intended to be just a starting point for discussion, and should not be confused with a decision or even a recommendation.

In brief, here is what I did:

Step 1: Fit the IH data from 1972-1994.

I used a simple exponential model: $y = a \cdot \exp(-bx)$, and fit the model to the data using minimization of square errors.

This model has the advantage that it can not go below zero, and it can take on a nearly linear form (if the data suggest that is appropriate).

I did not investigate other models, although it seems likely that other modeling strategies might be appropriate.

I first fit the data for each area independently, then I fit the data for all area simultaneously (assuming a constant b for all areas).

This approach would make sense if the rates of decrease over time were generally similar between areas.

[Note: Appendix F says that engineering changes in the trionizing area to reduce dust levels are not expected to impact the tract area.

However, the concentrations in the track and track unload areas appear to tend to decrease between 1972 and 1980. If so, why is this?]

Step 2: Extrapolate back in Time

Next, I used the model-predicted value for 1972 to extrapolate backward to 1957.

I did this both for the simultaneous fit (JEM-1) and fir the 4 independent fit(JEM-2) approaches.

I tried to do this extrapolation in the same way as described in Appendix F, although I am not sure I did this correctly.

Step 3: Extrapolate ahead in time

For the interval from 1994 to 2000, I just let the model predict

the values (forward extrapolation).
Alternatively, we could just use the model value from 1994 and hold them constant (as was done in Appendix F).
Not much difference either way.
Please review and send comments when possible.
Then, lets follow up with a conference call to resolve issues and choose the best plan.

Bill Brattin
SRC, Inc.
999 18th Street Suite 1150
Denver CO 80202
Phone: 303-357-3121
Fax: 303-292-4755
e-mail: brattin@srcinc.com



- Draft JEM Based on AM Values v1.xlsx